

REMARKS

Reconsideration is requested in light of the following remarks.

I. Rejection of Claims 36 and 37 Under 35 U.S.C. § 112 First Paragraph

Claims 36 and 37 are not new matter and are supported at page 7, lines 12-13 of the application.

II. Rejection for Double Patenting

The Office Action cited U.S. Patent 6,875,818 to Wang against the pending claims for non-statutory double patenting. A terminal disclaimer is submitted to overcome this rejection.

III. Rejection of Claims 10-17, 23, and 34 Under 35 U.S.C. § 102(b) and § 103(a)

U.S. Patent No. 6,437,050 to Krom was cited as allegedly anticipating claims 10-17, 23-25, 27-31, and 34-37 of the application. With the exception of claim 12, JP2000005, using U.S. 6,383,500 to Wooley as a translation, was also cited as anticipating or making obvious the same claims. The primary point of contention, that Krom does not disclose “mono-block and diblock polymer chains,” has already been reversed in a previously filed Pre-Appeal Brief Review Conference. The only possible difference, is that the current Examiner is framing the issue in terms of claim interpretation, not as a disagreement with what the reference teaches. This difference, however, is inconsequential.

The Examiner is not properly considering the meaning of the term “mono-block and diblock polymer chains.” The Examiner does not challenge the explanation in the previously submitted Declaration that the factual teachings of Krom are that the addition of monomer to the

diblock polymer chains recited in Krom would create either a longer di-block polymer or a tri-block polymer, depending on the identity of the added monomer. In fact, the Examiner contends that the previous Examiner was also not questioning this fact.¹ Instead, the Examiner contends in both the rejection based on Krom and the rejection based on Wooley that a di-block or tri-block polymer chain is both a mono-block and a di-block polymer chain at the same time.

Simply stated, a di-block or tri-block polymer is not both a mono-block and a di-block polymer chain at the same time. Interpreting the claim term mono-block polymer chain to be a part of a larger di-block or tri-block polymer chain would render the terminology of mono-, di-, and tri- block meaningless. A block (as opposed to random) polymer chain has either one (mono-), two (di-) three (tri-), or more blocks. A polymer chain that has two or three blocks cannot be said to be a mono-block polymer chain based on the fact that as a result of having two or three blocks it necessarily also has to have a first block. A person of ordinary skill in the art would not construe the claim term in the manner the Examiner has.

The contention may lie in the fact that the Examiner is ignoring the term “polymer chains.” Claim 10 does not refer to a mono-block *portion* of a multi-block polymer chain, but a mono-block *polymer chain*. The Examiner apparently believes that the term “mono-block and diblock polymer chains” means a single polymer chain that is a diblock polymer with homopolymeric (mono-) block portions. However, the term “mono-block and diblock polymer chains” clearly must mean mono-block polymer chains and (separately) di-block polymer chains. To interpret the plain meaning of the claims any other way strains credulity. Otherwise, as

¹ The Examiner requested Applicant to point out where the previous Examiner expressed disagreement about the factual interpretation of the cited portion of Krom. The previous Examiner’s original allegation as to what the cited portion of Krom implied was on page 3 of the Office Action of May 21, 2008. The subsequent Advisory Action also

explained above, the mono-, di-, and tri-, block terminology becomes meaningless. If the claim stated a mono-block *portion*, that would be another issue, but it requires a mono-block *polymer chain*.

It is recognized that “mono-block polymer chain” is not a particularly common term, which indicates that the specification should be referred to for its interpretation. From the context of the claim itself, it is clear that the term mono-block is used in conjunction with and in contrast to the term di-block polymer. Thus, it should not be read as meaning a sub-part of a diblock polymer. In fact, in light of this, the only reasonable interpretation of this term to one of skill in the art, however, is that it means a homopolymer: not a homopolymeric sub-part of a larger multi-block polymer. Furthermore, Applicants are entitled to be their own lexicographer, and it is clear that from the specification that a homopolymer is what is meant by mono-block polymer chain. On page 6, the specification states:

After formation of the first polymer, a second monomer is added to the polymerization, along with additional initiator. The second monomer polymerizes onto the first polymer to form a diblock polymer **as well as forming a separate second polymer which is a mono-block polymer.** (emphasis added)

Clearly, in light of the specification, the mono-block polymer chain of claim 10 should be interpreted to be a separate polymer, *i.e.* a homopolymer. Citation to this passage of the specification is not incorporating limitations from the specification into the claims. It is merely using the specification to clarify the meaning of an uncommon term that is in dispute.

Krom does not disclose any polymer chains in the final nanoparticle that have only one block. Krom discloses nanoparticles comprised of cross-linked diblock copolymers.

The mono-block polymers required by the claims are more than mere design choices, as can be seen in the Examples of the invention, where varying the mono-block polymer content increases the polydispersity of the nanoparticles.

IV. Rejection of Claims 24-25, 27-31 and 35-37 Under 35 U.S.C. § 102(b) and § 103(a)

A. Rejection based on Krom

In previous Office Actions, the Examiner had correctly noted that Krom did not disclose the limitation of a polydispersity index of about 1.5 to 10. However, when prosecution was reopened after the Pre-Appeal Brief Conference Review, the Office Action stated that this element was disclosed in Krom. However, the previous position is correct, Krom does not disclose this limitation either expressly or inherently.

As discussed with the former Examiner, and as summarized in the concurrently filed Examiner interview summary, it was requested that Applicants explain why the “dispersity less than about 1.3, more preferably less than about 1.1” disclosure in Krom (column 2, lines 13-15), is different and not obvious from the claimed about 1.5 to 10 size polydispersity index. The claim limitation is different (and not obvious), because it was unexpectedly discovered that higher degrees of polydispersity were achieved by adding mono-block (homopolymer) chains to the nanoparticles. This allowed the creation of nanoparticles of higher polydispersity by manipulating the ratio of mono-block and di-block polymers. As stated on page 7 of the specification, “[w]ithout being bound by theory, it is believed that at least a bimodal nanoparticle size distribution results because the micelle formation of mono- and diblocks is a bimodal distribution.” There is no teaching in Krom that allows this manipulation of the polydispersity index of core-shell nanoparticles to levels that reach about 1.5 to 10.

The only additional argument that the Final Office Action presents to bolster the bare assertion that Krom's disclosed polydispersity index of less than about 1.3 anticipates the claimed "about 1.5 to 10" polydispersity index is that "the 'further' monomer described by patentees [Krom] at column 3, line 10 would add to the active chain ends already present a ratio of mono to diblock of about 1 would result." However, as explained in the previously submitted affidavit by Wang and Pawlow, such a monomer addition would only make the nanoparticles larger as a whole, it would not be expected to affect the polydispersity index at all, and reliance by the Examiner on such a theory must be supported. *See* MPEP § 2144.03(A).

The only indication of polydispersity of the nanoparticles in Krom, is that they are preferably substantially monodisperse, with a Mw over Mn ratio of 1 being substantially monodisperse. (Krom, column 2, lines 11-13.) Krom also discloses that the nanoparticles preferably have a polydispersity of less than about 1.3, but more preferably less than about 1.1. (Krom, column 2, lines 13-15.) No person of skill in the art would read the claim limitation of "polydispersity index between about 1.5 and about 10" in the Krom reference.

B. Rejection Based on Wooley

Wooley clearly fails to disclose or teach the polydispersity index required by the claims, among several other limitations of the claims.

The first sentence of the summary of Wooley states that the invention is for novel **low** polydispersity particles. Example 4 of Wooley reports the polydispersity of the particles as 1.17, 1.14, and 1.10. No person of skill in the art would consider this to be an anticipating disclosure of the current claim element of a polydispersity index of about 1.5 to about 10. If anything, it

teaches away from the high polydispersity of about 1.5 to 10. Thus, Wooley is also not helpful as an obviousness reference.

Furthermore, Wooley lacks several other limitations of the claims, and the Examiner has clearly not made a prima facie case of unpatentability based on Wooley. Very few of the limitations of claims 24-25, 27-31 and 35-37 are discussed in the Office Action at all.

Accordingly, because the recited polydispersity limitation is not taught or even suggested by Krom or Wooley, independent claim 24 and its dependent claims should be allowed over the cited art.

V. Conclusion

Accordingly, claims 10-17, 23-25, 27-31 and 34-37 are believed to be patentable over the cited references and Applicants request that these claims be allowed.

Respectfully submitted,

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By: 

Nathan T. Lewis Reg. No. 56,218
Jones Day
North Point
901 Lakeside Ave.
Cleveland, Ohio 44114
(216)586-7078